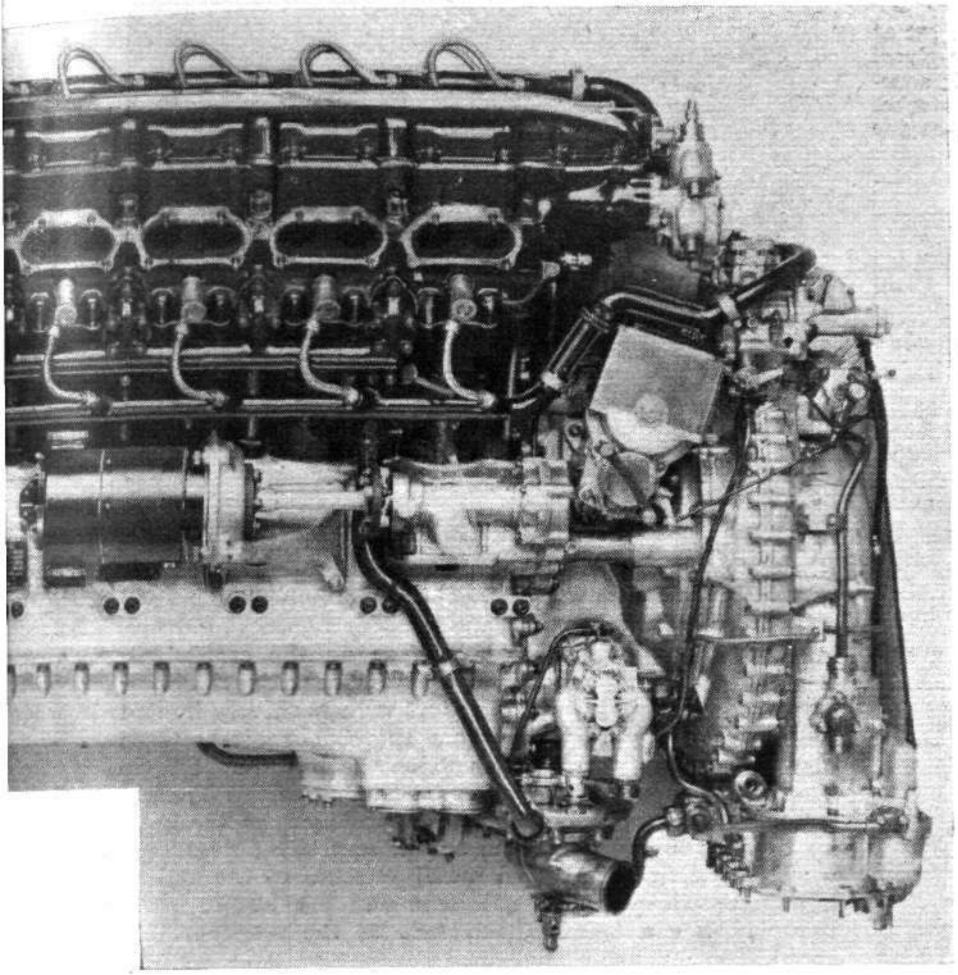
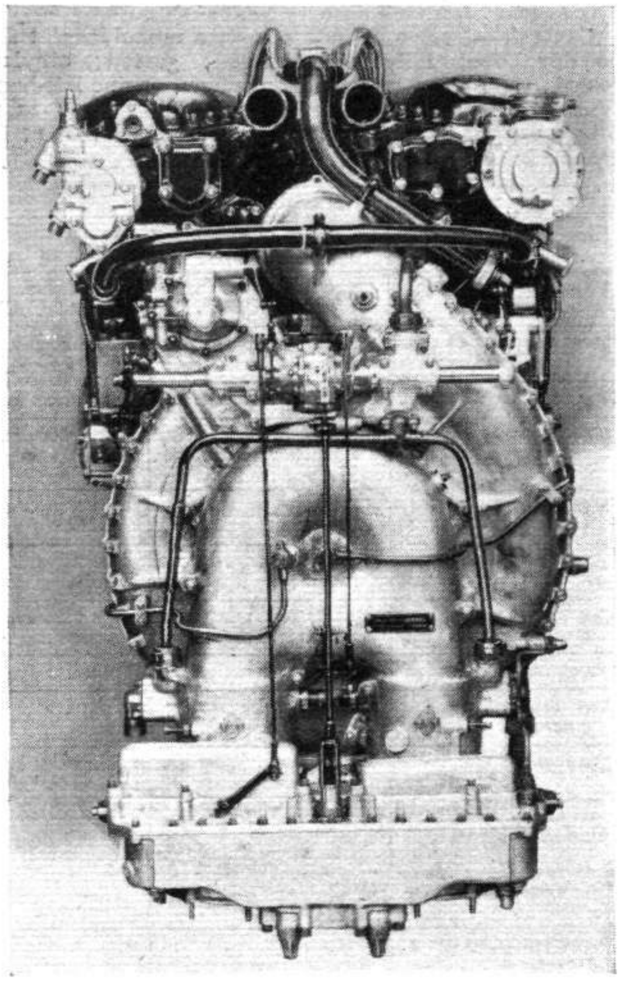
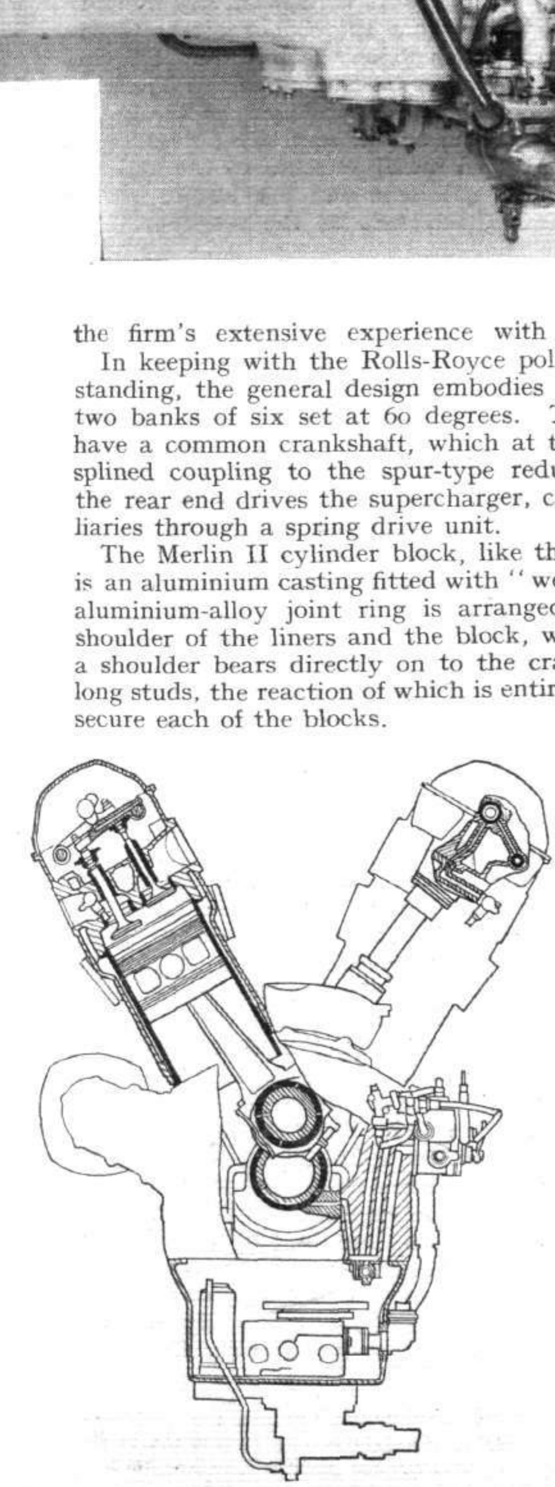




the firm's extensive experience with this arrangement.

In keeping with the Rolls-Royce policy of many years' standing, the general design embodies twelve cylinders in two banks of six set at 60 degrees. The cylinder banks have a common crankshaft, which at the front end has a splined coupling to the spur-type reduction gear and at the rear end drives the supercharger, camshafts and auxiliaries through a spring drive unit.

The Merlin II cylinder block, like that of the Kestrels, is an aluminium casting fitted with "wet" steel liners. An aluminium-alloy joint ring is arranged between the top shoulder of the liners and the block, while at the bottom a shoulder bears directly on to the crankcase. Fourteen long studs, the reaction of which is entirely upon the liners, secure each of the blocks.



The lower coolant joint is a spring-loaded rubber ring located in an external groove on the liners.

Oil from the overhead camshaft and rocker mechanism returns down stainless steel tubes let into the block, which are sealed from the coolant by rubber rings at each end and which carry the middle ten holding-down studs.

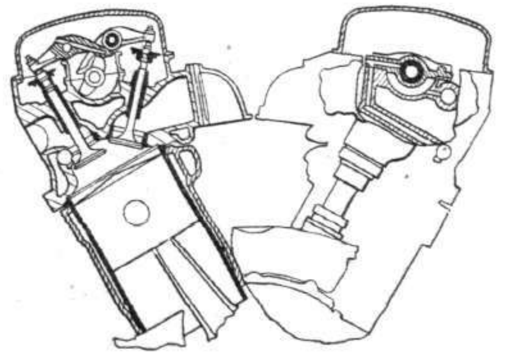
An additional six studs on each side of the block—a system first tried on the Kestrel XVI—improve the face joints and prevent disturbance of the liners when the blocks are removed. The top ends of the additional studs are blanked off and the lower ends made accessible through small separate covers on the blocks below the exhaust ports.

Special "turbulent" combustion chambers in a detachable head are a feature of the Merlin I in which the top flange of each liner is sandwiched between head and skirt with an aluminium joint ring above and below the flange. The head-liner-skirt assembly is secured by the usual fourteen large studs.

Both Merlin models have four valves per cylinder, each with two concentric return springs. Two sodium-cooled exhaust valves are on the outside of the head, and two inlet valves on the inside. All four valves of the Merlin II are parallel to the centre line of the block, but the two inlet valves in the detachable head of the Merlin I are inclined at about 45 degrees to the exhaust.

Inclined shafts from the wheelcase drive the overhead camshafts through bevel gears and each valve has its own rocker. The Merlin II camshaft assembly closely resembles that of the Kestrels.

In both engines the exhaust valves have phosphor-bronze guides; high-silicon-chrome steel seatings are screwed into the heads. Engaging surfaces and the valve crown of the



A direct comparison of head design is afforded in the drawing (left) of the Merlin II and (right) of Merlin I.